Fb
122
G2N
054

NOVEMBER 1966
VOL. 32 NO. 4

Soil Conservation

DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

SOIL CONSERVATION ON BUILDING SITES:

In Developing Urban Areas Page 75
Vegetation on Critical Sites Page 78
Urban Sediment Control Page 81
County Land Use Planning Page 83
Building Site Selection Page 87
A Thanksgiving Picture Story Page 84

CALIFORNIA INSTITUTE OF TECHNOLOGY
LIBRARY
NOV 16 1966
U. S. GOVERNMENT DEPOSITORY

SOIL CONSERVATION SERVICE U. S. DEPARTMENT OF AGRICULTURE

Answers . . .

We have talked a good deal of late about the unexpected soil and water problems that vex builders and land owners in new urban areas.

But what can we answer when people ask, "What can we do about it?"

We have some of the answers in this issue of *Soil Conservation.* They come mostly from the nearby Washington metropolitan area, where construction is booming and where soil conservation districts have taken the initiative in offering counsel to developers moving into their territories.

Pioneers: Since early 1962 WUC Glenn Anderson has specialized in the problems associated with rapid urban development in the Northern Virginia SWC District.

We sent a staff writer to work with him in recording the story of the pioneering conservation work in Fairfax County (p. 75)—also the first county we know of to employ its own soil scientist.

Technology: The treatment of urban building sites is calling forth a new technology of soil stabilization and runoff control.

Marshall Augustine draws on his long experience in the metropolitan areas of Maryland and the Eastern Shore (p. 78) to tell how to use vegetation on critical areas.

"Augie's" conversation bubbles with new ideas about how to make plants grow in difficult sites. We'll be hearing more of them later.

COVER: An aerial view of a highway interchange in Prince Georges SWCD, Md., reveals the extent of exposed land surface needing stabilization in any major construction project.

Soil Conservation

Devoted to the wise use of land and water resources

NOVEMBER 1966 **VOL. 32, NO. 4**

75 Conservation in New Urban Areas
By Glenn B. Anderson and Carolyn Johnston

78 Using Vegetation to Stabilize Critical Areas
By Marshall T. Augustine

81 Urban Sediment-Control Program in a Maryland County
By Edward R. Keil

83 Stoplight Code for Soil Maps Aids County Land Use Planning
By Robert H. Montgomery

84 For Conservation Benefits, We Give Thanks
A picture story by Adrian Achtermann

86 Conservation Clinic Qualifies Boy Scouts for Merit Badges
By Charles H. Williams, Jr., and Justus V. Baum, Jr.

87 Michigan Town Saves Money From Use of Soils Information
By Martin E. Kangas and Robert W. Johnson

89 Youth Corps Project Gives Conservation Training

91 New RC&D Projects

92 Conservation Profile
J. Harris Smith, Tennessee

93 Youth Conference Sets Goals for Creative Conservation
By George Fox

94 Review
Origins of American Conservation; New Publications

95 From the Administrator
Conservation Challenges in New Urban Areas

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget July 25, 1963.

ORVILLE L. FREEMAN — Secretary of Agriculture
JOHN A. BAKER — Assistant Secretary of Agriculture
DONALD A. WILLIAMS — Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service,
U. S. Department of Agriculture, Washington, D. C. 20250

BEN O. OSBORN, Editor
GEORGIE A. KELLER, Production Editor

Reprint permission: Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Photos available on request.

Commercial names: Mention of commercial enterprises or brand names does not constitute endorsement or imply preference by the Department of Agriculture.

Subscription: $1.75 per year, $2.50 foreign. Single copy, 15 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

Reston . . . city with a conservation plan.

Conservation in New Urban Areas

By Glenn B. Anderson and Carolyn Johnston
Work Unit Conservationist, SCS, Fairfax, Va., and Information Specialist, SCS, Washington, D. C.

EXPERIENCE, public opinion, and time—these are the forces that unite builders, public officials, and citizens in the practice of soil and water conservation in a rapidly developing suburban area.

The conservation outlook has changed strikingly in Fairfax County, Va., in the 5 years since the soil conservation district took the initiative in dealing with the problems of land changing from farm to nonfarm uses.

Fairfax County is part of the Washington, D. C., metropolitan area and is currently experiencing the full impact of massive urbanization. About 30 percent of its area is already built up, and 35 percent is in the process of development.

Supervisors of the Northern Virginia Soil and Water Conservation District (which includes Fairfax County) watched with dismay as major areas were damaged almost beyond recognition by erosion of building sites and the resulting flooding and sedimentation of lower-lying areas.

At the district's request, SCS assigned a soil conservationist to work full time on urbanization problems. The district announced its new program by distributing 500 leaflets on the need for erosion control. Personal letters to 265 bonded builders requested their cooperation and offered help, without charge, in conservation planning.

Only six builders acknowledged the letter. None requested assistance.

Today the soil conservationist has a backlog of requests that fills his schedule several weeks in advance.

And the county board of supervisors has just approved a major overhaul of its zoning ordinances that tightens the requirements for soil and water conservation.

Response to public demand

Under the revised regulations, which apply to all public construction work, builders and developers must (1) have conservation plans approved by the county in their zoning request, and (2) put up bond and cash in escrow as enforcement guarantees.

The new regulations came from recommendations of a special subcommittee of the Fairfax County

Planning Commission. The commission is also currently revising its master plan, with emphasis on watershed protection and flood prevention. To date, preliminary studies have been made on six watersheds, and SCS assistance under Public Law 566 has been approved for one of them, the Pohick Creek watershed.

A conservation program in a developing urban area could never get off the ground—or, more literally, on the ground—without the backing of public officials. Such backing, in turn, depends on the interest and initiative of local citizens.

Many civic groups have supported the program in Fairfax County, but perhaps none was more influential than the League of Women Voters. That organization was extremely effective in reaching more than a hundred other county associations that helped marshal public support for the zoning ordinances and building regulations.

Without strong public support, builders and developers may initially show little concern for conservation measures. After some experience with conservation versus nonconservation methods, however, the benefits of erosion control are convincing. Requests for help from builders *before* an emergency have gone steadily upward in the past few years.

A few case histories will illustrate some of the problems and the progress experienced in conservation work on land being converted to urban uses in Fairfax County.

The general conservation plan map of Tysons Corner International Shopping Center, prepared before earthmoving started, shows principal measures to prevent sediment from leaving the site during construction and to stabilize the final land surface. They are (1) two large debris basins at the foot of the slope, (2) two underground drains with surface inlets to collect runoff and seepage water and to serve as outlets for the debris basins, (3) temporary vegetation to be established as needed after rough grading, and (4) permanent vegetation to be established after final drainage.

City in the country

Reston, a "new town" in a rural setting already attracting national attention for the completeness of its planning, is the largest development in Fairfax County.

Its developers were among the first to request the district's assistance. After building a 35-acre lake, planned with SCS technical assistance, as a focal point for the new business and residential area, Reston developers went on to establish a number of other conservation measures.

They include: (1) A nursery to save thousands of plants that would otherwise be destroyed during construction; (2) planting some 30,000 tree seedlings on abandoned and eroded farmland; (3) an excellent water-disposal system ranging from elaborate storm sewers to simple grassed waterways; (4) bridle and fire trails with conservation features; (5) a comprehensive plan for the management of forest lands (Reston has a professional forester on its staff); (6) an elaborate irrigation system for the area; (7) nature centers, and the improvement of wildlife habitat by planting special food and cover plants; and (8) a continuing lake management program.

The result is both excellent land use and a strikingly beautiful mixture of urban buildings and rural landscape. The beauty will last, thanks to careful conservation planning from the beginning.

A shopping center

The largest commercial development in Fairfax County, when completed, will be Tysons Corner International Shopping Center. The 86-acre site had a range in elevation of 125 feet and some of the most erodible soils in the county.

The conservation plan for Tysons Corner was made prior to

A drainage ditch at Reston leading into Lake Anne is lined with concrete and rock. The surrounding area is sodded.

issuance of a grading permit by Fairfax County. The plan includes two temporary debris basins, constructed before major land grading began, to trap silt-laden runoff. They can store more than 4 inches of sediment from each acre of disturbed land and will be supported by diversion terraces and temporary and permanent vegetation. An underground drainage system, consisting of 18-inch perforated pipe with gravel-filled surface inlets at strategic points to collect runoff water, also was installed at the beginning of work on the project.

Sand and gravel mining

Sand and gravel mining is a major industry in Fairfax County. At one time, hundreds of abandoned gravel pits scarred the countryside.

In 1962, Fairfax County passed an ordinance requiring mine owners to rehabilitate gravel pits after they were exhausted. Companies were required to have an approved conservation plan and to post a bond of $1,000 or more an acre assuring that it would be followed before a zoning permit would be granted.

In the first 2 years, more than 600 acres of critical mined areas were restored.

Conservation measures used include debris basins, stockpiling of topsoil, careful grading of the entire area to conform to the natural lay of the land, replacing topsoil, and reseeding.

Individual homes

Miss Rebecca Dial, a retired school teacher, has lived in her attractive home for 17 years. A little creek, bordered by trees and shrubs, flows through her well-kept backyard, which she makes available for Sunday school outings.

To accommodate heavier runoff due to land changes upstream, Fairfax County officials proposed to take out the trees and shrubs and change the pleasant little creek into a shallow 30-foot-wide concrete-lined ditch.

Miss Dial objected. So did her close neighbors. They asked the Northern Virginia Conservation District for ideas on a waterway that would meet the drainage needs, yet still be attractive.

After considerable discussion the county decided to use a new plan for a 10-foot-wide creek with banks stabilized by concrete rubble.

Results? The necessary drainage was accomplished at less expense to the county for materials and use of equipment, and the neighborhood remains a beautiful area.

One landowner in the city of Falls Church had 15 acres of land worth at least $60,000 an acre. It was bordered by major highways and surrounded by luxury homes.

The soil itself was rocky and nonarable, much of it fill material from other excavations. It had no vegetation and was used as a dumping ground for trash. Nearby homeowners and apartment dwellers objected to the dust and unsightly view, but nothing was done.

Then a heavy rain washed large quantities of the denuded soil into nearby areas, clogging the streets and sewers. Firehoses were forced into the drains, but the silt was too compacted to budge. The city finally had to buy a special cleaning machine to open the drains.

Angry city officials were ready to sue for damages. The worried lot owner contacted the district

(Continued on p. 90)

A surface inlet (left), filled with gravel as a filter, collects water at the upper edge of the building site and conveys it to the underground drainage system at Tysons Corner Shopping Center. The author notes debris deposited by the water. At right, conservationist examines the brush guard on the outlet of one of the debris basins. Beyond is the trickle-tube that joins the same outlet connecting with the underground drainage system for the building site.

A planting of highbush cranberry, silky cornell, and redosier dogwood next to an overpass on an interstate highway eliminates the necessity of mowing in a difficult and hazardous location.

Using Vegetation to Stabilize Critical Areas in Building Sites

By **Marshall T. Augustine,** *Soil Conservationist, SCS, College Park, Md.*

DURING the past 200 years, Americans have changed the face of this country at a speed unequaled by any other nation. In doing so, we have created extensive and complex erosion, land use, and siltation problems.

Today, the development and use of powerful earthmoving equipment has made it possible to literally move mountains, create canyon-like cuts, and produce extensive fill areas.

This power, coupled with the demands of our exploding population and our economic prosperity, is bringing about, in many parts of the country, the rapid conversion of farms and woodlands to highways, industrial and shopping centers, subdivisions, and other urban uses.

Because land values are high, many urban developers feel obliged to strive for the most intensive land use possible.

All too often, the extensive grading operations for the installation of buildings, parking lots, roads, and the like are conducted with little thought to the resulting cut and fill slopes. These are areas which the conservationist must somehow stabilize.

A first step should be adequate planning and zoning ordinances providing conservation for rapidly developing areas. Then, the soil scientist, engineer, conservationist, and often the geologist must work together as a team from the planning stages through construction to provide the developer with necessary information to attain an acceptable degree of erosion control through vegetative practices.

Veteran conservationists will note several major differences between agricultural conservation work and work in areas of rapidly changing land use. These include:

(1) *Finality.*—Agricultural con-

A roadcut is stabilized by planting grass to the height of one mower swath above the ditch line and letting a voluntary growth of low shrubs cover the rest of the slope—in this case, honeysuckle and sumac. The entire slope was fertilized to stimulate the growth of natural vegetation where grass was not planted.

Temporary stabilization of cuts and fills is provided by straw mulch held in place by asphalt, both sprayed on with large machinery. Permanent vegetation is to be planted after construction and grading are completed.

servation planning and application allow flexibility in many practices. For example, a contour stripped field of corn, small grain, and hay could probably be converted to pasture, hay, woodland, or even to recreational use and still be within the capabilities of the soil.

On the contrary, once roads, parking lots, buildings, and utility lines are laid out and built, there is little chance of changing the land use, even if it is found not to be within the normal capability of the soil.

(2) *People.*—In farm and ranch planning, the conservationist works with a land owner or operator who is usually familiar with conservation programs, practices, and terminology. These same people, with the help of the conservationist, will apply the practices agreed upon.

In developing urban areas, the conservation or natural resource planning may be done by a single lot owner, a planning and zoning commission or department of public works representative, a home developer, or others. All these people are highly skilled in their fields but seldom conversant with conservation technology. To add another complication, the application of conservation practices is often contracted out to still other specialists.

(3) *Economics.*—The conservationist, in planning and applying conservation practices in areas of rapid land use change, is dealing with "big money." An acre in a subdivision usually has a dollar value many times that of an acre in agriculture. Conservation practices used when that acre was in agriculture may still be valid when it becomes a part of a subdivision, but these practices may be more difficult to plan and apply and should be rated in proportion to the value of the property protected.

Probably the most troublesome nonfarm erosion occurs on cuts and fills. Unfortunately, there are no hard and fast rules that govern slope stabilization. But we do know that a vegetated slope will inevitably break down if the soil itself is unstable, if it is subject to excessive overland flow or subsurface seepage, if the angle or length of slope is excessive, or if toxic materials are present.

Provided these difficulties are not present, the major limiting factor to stabilization becomes the moisture-holding capacity of the soil. If the silt-clay content is 25 percent or less, the soil's moisture-holding capacity is severely limited, especially on southern exposures.

Blanketing such slopes with a layer of soil containing 35 percent or more of clay and silt particles will dramatically increase the moisture-holding capacity and provide more vigorous plant growth. This material does not have to be topsoil.

A finely prepared slope seedbed is often a prime target for sheet and rill erosion, especially if there is a prolonged time before seeding. One preventive measure is to roughen the slope face before placing the topsoil. This practice is especially beneficial in bonding the topsoil with a compacted shale or slowly permeable clay soil.

If there is to be a time lapse between seedbed preparation and seeding, then work lime into the top 3 inches of soil, being careful not to prepare too fine a seedbed, and stabilize with a mulch-anchoring tool or with asphalt. The seed and fertilizer then can be applied in season over a protectively mulched surface in a hydraulic slurry.

Good clean straw mulch applied at the rate of 1½ to 2 tons an acre and anchored on a well-prepared seedbed probably provides the best erosion control.

New equipment and techniques are advancing the art of seedbed preparation, liming, fertilizing, seeding, mulching, and mulch anchoring, but we still need a wider range of better adapted plant materials.

From Canada to Florida, Kentucky 31 tall fescue is the old standby for slope stabilization, but it tends to thin out and become clumpy where intensive fertilization and management are not maintained. Its life span can be materially prolonged by working a generous application of superphosphate in with the lime.

Kentucky 31 tall fescue prefers cool slopes but will tolerate droughty to poorly drained soils.

The inside face of a watershed dam in the Rock Creek watershed, Maryland, is protected by Kentucky 31 fescue. The drainage channel formed by the angle of the dam with the original valley slope was stabilized before seeding by baffles of porous fiberglass matting and a jute lining.

It is hoped that SCS plant materials centers will soon be able to furnish us with a more rhizomatous tall fescue.

Sericea lespedeza makes an excellent companion legume for tall fescue, especially on heavy clay or sandy warm slopes. It is well adapted to the middle latitudes of the Eastern United States.

Due to its tall growth and winter dormancy, sericea may present a fire hazard. Several low-growing, prostrate lespedezas that avoid this problem are under observation at the National Plant Materials Center at Beltsville, Md.

Birdsfoot trefoil is a good long-lived companion for tall fescue at elevations of more than 2,000 feet in the northern half of the United States.

Reed canarygrass is still the best grass for stabilizing seepage areas. It also tolerates droughty slope conditions. Its tall vigorous growth limits its usage, but new low-growing strains are under observation.

Crownvetch, a long-lived fast-spreading legume, persists where adapted, with very little maintenance in the northern two-thirds of the country. It will grow on coarse-, medium-, and fine-textured soils. It grows best in limestone areas.

Currently more use is being made of warm-season grasses for critical area stabilization. Tufcote bermudagrass, released by the National Plant Materials Center and the University of Maryland, is a hardy warm-season grass that spreads rapidly even under difficult soil conditions. It is established by sprigs, plugs, or sods.

Tufcote is resistant to traffic, salt spray, and drought. It is long-lived but, like all bermudagrass, should be fertilized annually. Its range extends from the deep South through the Coastal Plain and Piedmont regions as far north as Delaware.

In some cases, it is impossible to have an acceptable silt-clay content with the moisture retention needed for cool-season grasses. The hydraulic fills in tidewater areas, with their heterogenous mixtures of sand, gravel, and silt, and cuts and fills in deep Coastal Plain sands, are cases in point. Here, tall-growing warm-season grasses, such as weeping lovegrass or American beachgrass, can be used to stabilize the areas.

Weeping lovegrass provides a better and longer lived erosion-control cover if seeded with sericea lespedeza and if adequately limed and fertilized. It will not tolerate sand deposition.

American beachgrass is now available at commercial nurseries along the east coast. If planted on an 18- by 42-inch spacing and fertilized at the time of planting with deep-placed controlled-release fertilizer, it will produce an erosion-control cover in less than one growing season. No mulch or lime is required, and no topdressing for 3 to 5 years. It thrives on sand deposition.

The high maintenance cost of grasses and legumes is causing increasing demands for other ground covers, such as shrubs, for slope stabilization, particularly above the mowline on highway slopes and interchanges. These plants are more difficult and expensive to establish, but once established they provide a long-lived low-maintenance cover.

Plants on a variety of low-fertility soils, ranging from sand and gravel to clay, showed excellent growth when controlled-release magnesium ammonium phosphate fertilizer was used. The fertilizer was placed in the bottom of the planting hole at the time of planting.

In mass slope plantings in the past, specimen-size plants have had to be used to secure adequate survival. With improved stock, fertilizers, mulching materials, and techniques, young planting stock can be used at a substantial savings.

The field of stabilizing critical areas with vegetation is relatively new. It is a challenging and dynamic field. ♦

A giant step forward . . .

Urban Sediment-Control Program Adopted by Maryland County

By Edward R. Keil
State Conservationist, SCS, College Park, Md.

TAKING direct action to curb the increasing menace of sediment damage to high-value watersheds in the Washington, D. C., area, nearby Montgomery County, Md., officials and soil conservation leaders have recently adopted a sediment-control program cited by local leaders as "the first giant step toward a new era of urban conservation." The program has the enthusiastic backing of local building contractors.

Five major practices to relieve a sediment rate that runs as high as 2,300 tons per square mile annually in some Potomac River subwatersheds were worked out cooperatively by Soil Conservation Service officials, the Montgomery County Soil Conservation District, the County Council, the Maryland National Capital Park and Planning Commission, the Washington Suburban Sanitary Commission, the Suburban Maryland Builders Association, and the Montgomery Home Builders Association.

New construction procedures include: As brief as practical exposure of scalped soil; quick seeding, or other means of replacing plant cover; saving as much natural vegetation as possible; construction development in harmony with natural topography and drainage patterns in larger projects; and the installation of temporary sediment basins where other measures do not achieve controls.

Technical conservation guide sheets for contractors have been issued to 1,200 members of the Suburban Maryland Home Builders Association (SMHBA) by Colonel Robert E. Brennan, executive director. The Suburban Home Builders made housing construction starts valued at $97 million during 1964 in Montgomery County alone, and all evidence points toward continued heavy building. Montgomery County is a 500 square-mile area abutting the District of Columbia.

A task force to develop plans for sediment control in the county was organized 2 years ago. Specifications for the program were derived from a quarter-century of experience in land management gained by landowners in the county's rolling, highly erosive Piedmont soil.

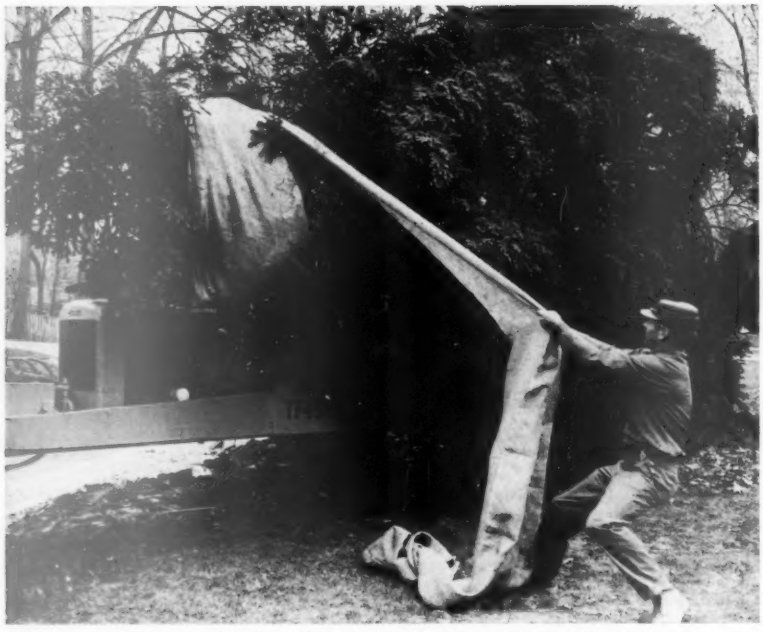
The legal authority for the program came from the standard reference for developers, "Subdivision Regulations of the Maryland-Washington Regional District." The program relies upon existing agencies for implementation and is flexible enough to fit the physical variations in the county and other technical considerations.

Program procedures for developers and participating agencies are:

Preapplication stage.—The developer and his engineers receive consultive assistance from county agencies and the soil conservation district. The developer becomes a district cooperator and receives soils information and guide standards for erosion-control measures.

Preliminary subdivision plan stage.—The developer submits his plans to the Park and Planning Commission. Along with other necessary reviews, the plans having significant erosion potential are referred to the soil conservation district for a check of erosion-

An SCS technician checks the depth of silt washed from the bare ground above. Disturbed land, left unprotected, sends tons of silt into streams below. Proper conservation measures can reduce this problem.



A 25-year-old spruce, just removed from the ground, is wrapped in burlap to be transported to a nursery temporarily and later replanted in a housing development.

control plans. The district furnishes technical assistance in planning satisfactory sediment-control measures.

Recording stage.—The required erosion-control practices are incorporated in the public works improvement agreement which must be completed before the subdivision plat is recorded.

Construction permit stage.—The Department of Public Works reviews the application for conformance with sediment control and other provisions of the approved preliminary subdivision plans.

Construction stage.—The soil conservation district furnishes consultive technical assistance to the developer and his engineer in establishing the planned sediment-control measures.

Compliance.—The Department of Public Works enforces compliances with the plans.

SCS technical aid, furnished through the Montgomery Soil Conservation District supervisors, has helped speed results and gain the builders' acceptance of conservation help. SCS aid includes onsite soil information, water-runoff surveys, the design of erosion-control structures, and advice on special vegetation.

Early benefit

One early benefit from these activities was Federal approval for a $\$1/2$ million flood-prevention and recreation lake located near the center of Montgomery County's half-million population. The lake is part of the Rock Creek Watershed Project, which had been halted for a time because of the threat of uncontrolled sediment.

The Maryland building developers' experiences with soil- and water-saving techniques have resulted in improved conservation methods and a better knowledge of costs and returns. Officials cite an average of \$20 to \$30 in conservation expenditures for a 100- by 100-foot lot.

Land operators already embarked on the new approach can cite many advantages to offset expenses. William Hurley, project director for a 2,100-acre, self-contained village planned for the county, offered SMHBA his findings as an example.

Hurley said the village, planned as a 20-year development, will eventually house 12,000 families. Although \$235,000 will be spent on conservation measures, including 40 sediment basins, he expects benefits to exceed costs.

Two lakes on the development will help trap excess silt during the building period. These will be used later for recreational purposes. Large areas of open spaces and parkland will be planted to trees, to help enhance the village atmosphere. A number of the sediment basins will eventually become water hazards for an 18-hole golf course.

"Best of all," adds Hurley, "as we go along, we don't have to work up to our knees in mud. We get continuous access for year-round selling. Already we find buyers sense the 'countryfied' touch and are willing to pay the freight for it."

Encouraged by the progress to date, Maryland builders have organized their own sediment-control committee, chairmanned by James O'Mara, a consulting engineer. The group aims to help develop conservation technology as applied to urban construction, study related economics, and assist in pertinent legislation.

Principles of success

To keep the Montgomery County's Sediment-Control Program on course, a steering committee selected from the original task force meets annually. Progress is checked and new directions given as needed, to insure steady improvement in techniques, design, and the economics of installation. The building industry continues its participation.

Basic to the success of a sediment-control program like this are several important elements:

(1) All affected groups should participate. This has been a cardinal principle with SCS in carrying out its national soil and water conservation program. And it works!

(2) Sediment control should be a stated policy of local government and all other concerned agencies in the county. Without this, support is unofficial and half-hearted.

(3) An effective public relations program is necessary to get public and industry support.

(4) Competent technical personnel and workable procedures and enforcement are essential. Broad participation in the work makes this more easily attainable.

(5) Sediment control must be incorporated in the planning stage of subdivision development for most effective application during construction. The "plan your work and work your plan" principle applies here.

(6) Accepted technical principles must be used and skillfully applied to provide significant sediment reductions.

(7) Research and periodic evaluations should be provided for, to bring needed improvements and up-dating to the program.

Although Montgomery County's Sediment-Control Program is still in its early stages and some problems have arisen, all agencies and groups are cooperating well. Considerable amounts of sediment are still going into the dams and into the Potomac River from the rest of the county, but we are confident that this program will result in significant reductions at reasonable cost. ♦

Soil Conservation to Schools

The Steward Soil Conservation District in Tennessee sends complimentary subscriptions of *Soil Conservation* Magazine to each high school library and vocational agriculture department in the county. ♦

Stoplight Code for Soil Maps Aids County Land Use Planning

By Robert H. Montgomery
Soil Scientist, SCS, Batavia, Ill.

THE GLOW of colored soil interpretation maps warns of limitations or signals "full speed ahead" for proposed uses of land in McHenry County, Ill.

Land capability classes indicated by color on aerial photos have aided the planning of agricultural land for many years. But McHenry County Soil and Water Conservation District officials are now using colors to discourage improper nonfarm uses of land. Homes, factories, roads, parks, and other installations have soil related problems.

In their interpretations, green (as a go sign) is used to indicate few or only slight limitations for a potential use. Yellow (caution) indicates a moderate limitation—problems which can be economically overcome. Red (stop) shows severe limitations. Red does not mean that the soil cannot be used for a specific purpose but rather that problems are severe and may not be economically feasible to correct.

McHenry County, located 35 miles northwest of Chicago, is still predominantly rural. However, it is an integral part of the rapidly growing Chicago metropolitan area, and nonfarm uses of land are increasing rapidly. The cooperative soil survey of the county, a joint undertaking of the Soil Conservation Service and the University of Illinois, was published in 1965.

The McHenry County District began using the new soil survey information with their farmer cooperators as rapidly as it was mapped. But the supervisors knew they were not reaching the rapidly increasing number of people involved in nonagricultural uses of land.

In 1963, members of the board learned of work being done in Ela Township in Lake County, Ill., where officials were pioneering in using colored interpretations of soil maps to guide urban development. Soon after McHenry County created a planning commission, the conservation district offered to assist by providing soils information as a part of the planning inventory.

As a beginning, the Soil Conservation Service provided the needed interpretations. Four interpretations were made: (1) Agricultural limitations, (2) septic tank disposal field limitations, (3) building foundation limitations, and (4) flooding potential.

The county hired a girl to color maps as indicated by SCS interpretations and appropriated money for map reproduction.

The planning commission has developed a mylar base map of each township of the same 4-inch-per-mile scale as the soil interpretive maps. When the base map is placed over the interpretive map, it is easy to see the degree of soil limitations for a specific use.

One of the most important functions of these maps is to furnish factual information to the zoning board as a basis for making zoning decisions. The soil maps are also effective in the planning or preventive approach to flooding and sanitation problems. The information is presented in such clear, readily interpreted manner that it has become an everyday working tool for land use decision makers in McHenry County. ♦

The author takes no credit for the development of the stoplight approach to land use planning. It has evolved through the efforts of many people during the past 5 years.

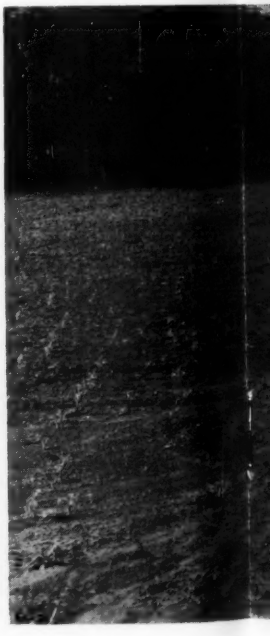
For Conservation Benefits . .

We Give Thanks

THE FIRST Thanksgiving was celebrated by men and women who survived largely because friendly Indians taught them how to use a strange land wisely. Since then, American agriculture has gone from survival to opulent abundance. Today, Americans are among the world's best-fed people even though we spend only about 18 percent of our income on food.

All over the Nation, young mothers like Mrs. Adrian Achtermann of Millersburg, Ohio, (right), find the produce of the earth is plentiful with which to feed her family.

This Thanksgiving, millions of families, like the Robert Wachtel family of Millersburg (far right) will bow their heads and thank God for the bountiful soil that, when well and properly tilled, provides us with the food that is the basis of life.

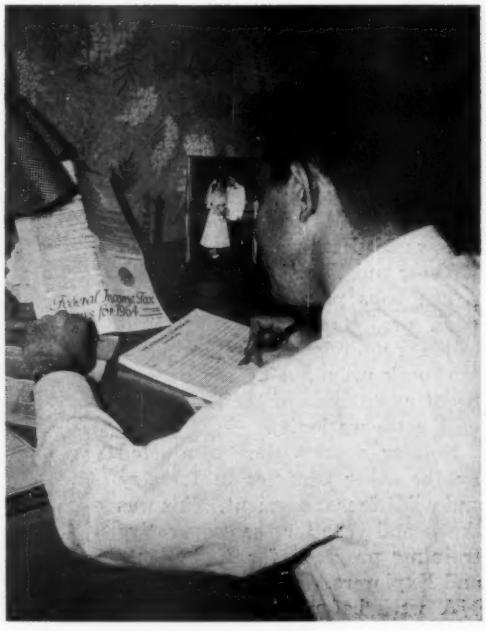


Good soil stewardship is seen on this Amish farm (below) near Berlin, Ohio. Note the contour strips. Only a few miles away, another farm (right) shows the havoc of sheet erosion caused by a 1-½-inch rain on unprotected land. Such loss affects not only the present owners but future generations also.

Above—"Let us give thanks for this abundant food that is provided by proper tillage of the land. Let us ever be mindful that we can eat balanced diets because of the foresight of our many conservation farmers. May we continue to give our praise to the Almighty God for instilling within farmers the desire to farm the conservation way for the benefit of all mankind."

Tax dollars are used to help in aiding conservation work on the farms of America. Below, Robert Wachtel works on his income tax form.

These pictures by Adrian Achtermann, SCS work unit conservationist, Millersburg, Ohio, won the recent Oliver Photo Award for Ohio.



Conservation Clinic Qualifies Boy Scouts for Merit Badges

By Charles H. Williams, Jr., and Justus V. Baum, Jr.
District Scout Executive, B.S.A., and Work Unit Conservationist, SCS, Williamsport, Pa.

A 1-day, conservation clinic at Camp Kline near Williamsport, Pa., culminated a series of separate workshops and local projects last spring for Boy Scouts and Explorers working on conservation merit badges in the West Branch Council.

Specialists of the Soil Conservation Service, Pennsylvania Department of Forests and Waters, and Pennsylvania Game Commission joined in supervising 150 boys in a day of work on the campgrounds and testing their knowledge of conservation subjects. The merit badge certificates were given at an award ceremony following the field activities.

In the month preceding the clinic each agency had instructed the boys working to qualify for merit badges in soil and water conservation, forestry, and wildlife management.

Soil Conservation Service employees at Williamsport had conducted three evening workshops for a hundred boys studying soil and water conservation. They used motion pictures, charts, publications, and discussions to explain the subjects, "Learning the Land," "How to Use the Land," and "Water and You."

The boys performed individual work projects to meet the merit badge requirements, following a workbook prepared by the district Scout executive and the SCS work unit conservationist.

Similar courses were conducted by the other agencies in forestry and wildlife management. This was the second year for the cooperative training program for the Scouts and Explorers.

A week before the clinic itself, officials of the Boy Scout council and the SCS visited the camp and laid out the work to be done according to the conservation plan previously developed in cooperation with Lycoming County Soil and Water Conservation District. Projects planned were transplanting of trees from the nursery to troop campsites, planting of 5,000 tree seedlings in a new tree nursery site, planting of shrubs for wildlife, shaping side slopes, fertilizing and planting of grass seed on a drainage ditch and the waterfront swimming area, and planting of basket willow for streambank erosion control and a multiflora rose living fence.

On the day of the clinic, the Scouts and Explorers reported to the camp early, dressed in work clothes and equipped with buckets and shovels. They were met by men from the conservation agencies and assigned to work groups according to the merit badges they were working on. One group worked on the drainage ditch and waterfront area, another group transplanted trees, a third planted seedlings in the new nursery, and a fourth planted multiflora roses for wildlife cover.

Following lunch, the groups exchanged projects. The experience not only gave the boys a better understanding of conservation but also made good progress in installing planned conservation practices on the camp.

Camp Kline is one of the oldest Scout camps in the Nation, dating back to 1920, when James N. Kline, a Williamsport businessman, bought a 360-acre farm and donated it to the local council for a camp. The land included 160 acres of flat land then being farmed and 200 acres of mountain land.

Meantime, many trees have been planted and the camp has one of the finest arboretums in the State.

Scouts working for Soil and Water Conservation Merit Badge dig young trees from nursery for transplanting to campsites.

The authors, Charles Williams (left) and Justus Baum, plan the rotation of campsites as a part of the conservation program on Camp Kline.

The conservation plan calls for completing the reforestation of the 100 acres of flat land and converting it to suitable troop campsites, the planting of ground cover on recreation areas, and the completion and seeding of a drainage ditch to divert mountain runoff from the campsites. ♦

Chemicals Clean Muddy Water for Storage

Inexpensive, easy-to-apply chemicals can clean muddy surface water and make it fit to pump down into the water table, reports Victor L. Hauser of the Agricultural Research Service.

In areas, such as the Southern High Plains of New Mexico, Oklahoma, and Texas, water collects in undrained basins called playas. Soils in the playa floors are virtually impermeable, and almost all the water that collects there is lost to evaporation.

For some time scientists have been experimenting with wells to pump this water into the ground where it can be stored for later use. Muddiness of the water has been a major obstacle; sediment quickly plugs up the wells. Filtering systems prove difficult to clean and operate.

A mixture of alum and cationic polyelectrolyte added to the water reduces the sediment content by 90 percent. ♦

Michigan Town Saves Money From Many Uses of Soils Information

By Martin E. Kangas and Robert W. Johnson
Work Unit Conservationist and Soil Scientist, SCS, East Lansing, Mich.

GOOD SOILS information sliced more than $60,000 off the cost of a new high school in Ontonagon, Mich. As an added result, Ontonagon industries, home builders, and county planners are now also making widespread use of soil surveys.

The Michigan community of 3,400 people began to plan a new high school after the adjoining school districts of Rockland and Mass were merged with it. The logical site seemed to be an area close to the old high school.

However, some community leaders felt they wanted basic soils information before additional land was purchased. So the school board asked the Ontonagon Soil Conservation District for soil maps and interpretations on three potential sites.

Soil Conservation Service in cooperation with the Michigan Agricultural Experiment Station prepared maps and interpretations for the areas showing such items as soil texture, permeability of the soil layers, and depth of soil to the water table. They also provided an evaluation report on soil limitations affecting building foundations, frost action, winter grading, and any development of playground and sport areas.

The SCS soils study was presented to the Ontonagon school board, the consulting architects, and other interested persons. The architects used the report when preparing cost estimates for each site.

When the cost estimates were submitted, the school board was startled to discover that construction on their first choice location would cost $60,000 more than on the closest alternative. Soil-related problems were the major reason.

For example, the construction of the athletic field on the preferred site would be $30,000 more expensive than on the second site. Extra excavation costs of $16,000 for the building would also have occurred because of shale near the surface. Wet plastic clays overlying the soft shale was another cost-increasing factor.

By contrast, the best alternate site consisted primarily of deep-, well-, and moderately well-drained sands with areas of deep wet sands. Some drainage was needed in both sites. The alternate site was primarily in woodland with a variety of woody and herbaceous species. Since the school board planned to develop an outdoor laboratory for nature study at the new school, this was an important factor to consider.

Citizens vote on site

As discussion of the various sites went on, the school board decided that voters themselves should have a choice in deciding. It was, after all, their money being spent.

A referendum was called. The public was presented with the facts on various site selections. They voted overwhelmingly in favor of the alternate, wooded, less expensive site. The school board agreed, and all factions of the community gave their support to the now-most-popular choice.

Later, a bond issue of $2,150,000 was passed by the voters, by a 2 to 1 margin.

Miles Plutchak, president of the

Ontonagon School Board comments:

"The soils and site information provided by the Soil Conservation Service was invaluable to the school board in directing our new building program to a successful conclusion. It gave the public sound, unbiased information necessary in this kind of public project."

SCS help continues

As school construction began, SCS continued to play an important role. It provided help in planning the location of school buildings, parking areas, and roads. It also helped with the drainage arrangements and plans for the establishment of an outdoor nature study area.

It is the opinion of the consulting architects that the technical assistance and information provided by SCS in site selection and development, drainage, and land use not only saved the community tens of thousands of dollars but also gave the architects the local information and assistance needed to design the type of educational plant the community needs and can afford.

Ontonagons are looking forward to their new high school, confident they have chosen wisely in their site-selection plans. The experience has resulted in wider use of scientific soils information by many other groups in the community.

A "prestige" residential subdivision called Country Club Estates has used soil maps and interpretations extensively in its development plans. The Ontonagon Historical Society requested detailed information before it chose a site for a new museum building. Similar information was provided by SCS in the plans for a new community hospital and Medicare facility. Picnic sites, roads, and parking sites are a few other areas where Ontonagon officials are using SCS technical information.

And still more uses

A 40-unit senior housing development in Ontonagon also benefited from soils information. Three sites were investigated and abandoned because of poor soil conditions before a suitable area was found.

Warren Millard, Ontonagon village engineer comments, "The Housing Commission saved more than $7,000 in fill material alone by selecting an alternate site for its buildings." He pointed out that, by having information available early in the planning stages, it was easy to select a new site.

Industry, too, is calling for soils information. The White Pine Copper Company used SCS assistance to help control erosion in their mine-refuse area. Some of the earthfills are more than 90 feet high and up to 5 miles long.

The value of soil and water conservation assistance in Ontonagon County might be summed up by the comment of Robert Mazurek, chairman of the County Board of Supervisors:

"Soil conservation districts are now providing rural communities like ours with the kind of assistance and technical information we have needed but have been unable to obtain, much less afford." ♦

School officials study the site plan for Ontonagon School, based on soils information provided by the Soil Conservation Service. Left to right: James Webber, principal; Francis Zimmer, site committee chairman; and Victor Keefer, superintendent.

REA Loans Benefit Consumers

More than 6,150 new rural consumers in 9 States, as well as existing consumers, will benefit from $7,849,000 in loans approved by the Rural Electrification Administration. Loan funds will finance construction of 577 miles of distribution lines and 135 miles of transmission lines and provide related system improvements.

Borrowers are in Alabama, Arizona, Michigan, Missouri, Nebraska, Oklahoma, South Carolina, South Dakota, and Virginia. ♦

Reports on Farm Products

To supply the need for agricultural statistics, some 700 reports are issued in Washington each year and hundreds more in the States for nearly 200 farm products. ♦

Youth Corps Project Gives Conservation Training

"OUR DISTRICT expanded its conservation program as a direct result of help given by Neighborhood Youth Corps enrollees," says Herman Link, chairman of the Buffalo-Ravenna Soil and Water Conservation District in Nebraska.

Link's comment is typical of many received from conservation district supervisors all over the State who were fortunate enough to get the services this past year of some of the 290 young people getting conservation work training under a cooperative project.

Emmett Lee, president of the Nebraska Association of Soil and Water Conservation Districts, goes further. "I am looking forward to an indefinite extension of this NYC project," he says. "I believe the districts, Soil Conservation Service technicians, and NYC enrollees all will benefit from their experiences in participating in such a project."

NYC enrollee, Nadine Dandridge (left) operates an engraving machine to make native grass identification tabs for the Nebraska Centennial grass plots. Steven G. Ottmans, assistant project director, looks on. Larry Hipp gets practice with the level while assisting SCS technicians overseeing the construction of a dam in the Pilger watershed, Stanton County Soil Conservation District.

Enrollees like NYC

And how do the young enrollees themselves feel about it?

One enrollee says, "I am very thankful to receive this opportunity of working with such thoughtful people. I am pleased to share the enjoyment of being a useful working citizen."

Another enrollee feels the program can have a strong impact on personal attitudes toward society. "If I hadn't received this opportunity, I don't know what would have become of me. Now I feel I belong."

An unsolicited letter from one of this year's enrollees says, "My name is Sandra Olejniczak, and I am a Neighborhood Youth Corps enrollee from Dakota County. I wish to thank you and all the people connected with the Youth Corps for making it such a worthwhile and rewarding experience. I have had the privilege of working with and meeting many wonderful people this summer. They have taught me much that I am sure will be of benefit to me the rest of my life. I am entering college soon, so I will be unable to sign up for the Neighborhood Youth Corps again."

Neighborhood Youth Corps enrollees, working under the sponsorship of the Nebraska Soil and Water Conservation Commission, do a variety of jobs. The boys help with conservation survey and layout, color and ink soil survey maps, interpret field survey notes, work on district and watershed maintenance activities, and help with other district activities including equipment maintenance.

The girls help with typing, filing, and clerical and secretarial work.

The NYC project is administered by three permanent commission staff members assisted by the local conservation district supervisors and district clerks. SCS technicians help with guidance and counseling. Supervisors and technicians both outline the work and training.

The commission-sponsored NYC project has been well accepted by the 86 districts in Nebraska. Seventy-eight of the soil and water conservation districts and 3 watershed districts have assisted in the training of 290 youths.

On to better jobs

Warren Fairchild, executive secretary for the Nebraska Soil and Water Conservation Commission, is proud of results to date. Besides training given the young people, he points to the improved prospects opened to "graduates." Of some 160 individuals "terminated," 75 have returned to school, 37 have graduated to better jobs or permanent jobs (3 of them as part-time employees of SCS), and 30 have left to enter military service. Training is currently being given to 130 youths.

The original agreement for the commission NYC project was signed into being on May 21, 1965, for a 6-month period. The original project called for 292 enrollees of which 42 were to be girls. This

project was amended twice by the Department of Labor, thereby extending it to August 31, 1966.

All soil and water conservation districts using NYC youths show an increase in conservation accomplishments the past year. Layout work, especially, has been speeded up, according to C. Dale Jaedicke, SCS State conservationist.

"We have been pleased to cooperate with the State commission in providing couseling and day-to-day supervision," said Jaedicke. "NYC enrollees have made material contributions to on-the-land conservation across Nebraska. Their practical training is resulting in a source of qualified youth for job needs of contractors, landscape nurseries, government, and others. We look forward to a continuing NYC program."

Due to success of the present project, the commission has submitted a request for another NYC contract to give work training to 100 individuals, 70 of them out of school and the other 30 in school.—J. DUANE CHAMBERLAIN, *Project Director, Nebraska Soil and Water Conservation Commission, Lincoln, Nebr.* ♦

Urban Areas

(Continued from p. 77)

for help in erosion control. District and SCS officials recommended stabilization through temporary seeding of sudangrass and a permanent cover of Kentucky 31 fescue and bermudagrass. They also recommended a diversion, grassed waterway, and a small desilting basin.

Skeptical kibitzers doubted that anything would ever grow on the poor fill soil, but it did, and today the fescue and bermudagrass are more than 2 feet high. Erosion control is effective, and there have been no further complaints of sedimentation from this source.

Total conservation cost? An estimated $2,500 for the 15 acres of land worth at least $900,000. Thus, the owner spent less than 0.003 percent of the land's value to directly preserve that value. The cost of conservation on land in rapidly changing areas is almost always only a minute fraction of the land's value.

Somewhat similar is the case of the man who subdivided about 50 acres of sloping land. He built some $50,000 to $60,000 homes at the bottom of the hill, denuding the upper slope but doing no conservation work and leaving it without cover for more than a year.

Runoff water, not surprisingly, rushed downhill and carried great quantities of sediment into and around the expensive homes and driveways at the bottom. More lawsuits were threatened.

The developer was advised to fill in the gullies, complete the storm drainage system, use a temporary cover of vegetation, and put in grassed waterways. In addition, he was urged to complete the current work of street paving quickly and to keep a minimum amount of land exposed. He followed the recommendations with good results.

Developers, like most people, learn through experience, that conservation pays in money, land values, and community goodwill. More and more of them are buying special conservation equipment, such as hydromulchers, or discovering conservation uses for their regular equipment. A number of developers and builders are also employing people professionally trained in conservation methods.

What other steps can conservation-minded builders take, not only in Fairfax County but throughout the United States?

(1) First and most important, plan for conservation from the beginning, rather than waiting until storms have washed soil and debris downstream and lawsuits are threatened, costs are greater, and results more uncertain.

(2) Plan so that ground cover is off for the shortest possible time. The critical erosion period is after the natural cover is removed and before construction is completed.

(3) Use, as needed, debris basins, diversions, terraces, and grassed waterways. Also, seed both temporary and permanent vegetation following rough grading.

This does not need to be expensive. Actual costs for temporary vegetation in Fairfax County run about $62 an acre using machinery but no mulch, and $142 an acre with mulch.

Temporary vegetation will protect the site for 6 to 12 months. Permanent vegetation should be used for longer periods.

(4) Consider protective measures for trees and topsoil. Some large developers have special tree-moving machines that enable them to "stockpile" trees for later replanting. A few companies employ professional foresters.

Some conclusions

Perhaps the three major conservation problems in Fairfax County today are building developments that denude the land for long periods, existence of many homes on flood plains, and building on land with adverse topography.

The first two problems may gradually be coming under control as developers realize that they gain little and lose a great deal by such practices.

The use of land with adverse topography will probably become more acute, since much of the land with favorable topography is already built up. Conservation measures, therefore, will become more important as time goes on.

But conservation in developing urban areas is needed *now*. In Fairfax County, as in many others, by 1980 most of the land use decisions will be made and the conversions completed. If mistakes are made, great sums of money

will then be spent to correct what could have been prevented, but much of the loss will be irreparable. Urban land uses do not have the flexibility of farm uses; acres of cement and miles of underground wiring cannot easily be altered.

Some measure of county or other local controls appears necessary. It is unwise, however, to have conservation regulations so stringent that they cannot be enforced.

We must recognize that erosion control in areas of construction can never be complete. Some erosion will occur despite the best possible measures and the most conscientious application. The aim is to prevent controllable erosion and keep sediment and flood damages to a minimum. ♦

Planners' Institute Studies Environment

Under a $39,264 U. S. Department of Agriculture research contract, Purdue University engineers will conduct a 3½-year laboratory study to test equations expected to help scientists predict the depth and duration of floodwaters.

Sponsored by the Agricultural Research Service, the Purdue Research Foundation, Lafayette, Ind., will direct the study. Project leader will be Dr. G. H. Toebes, hydraulic professor in the University's Civil Engineering School. Heggie N. Holton, director of the USDA Hydrograph Laboratory, will represent ARS.

The engineers will use a tilting flume and various rates and depths of waterflow to simulate possible flood condtitions. ♦

Farm and Ranch Reporters

Some 700,000 farmers and ranchers are crop reporters, of whom about 60,000 cooperate in enumerative and objective yield surveys. ♦

New Resource Conservation Projects

FEDERAL ASSISTANCE to local sponsors of three new Resource Conservation and Development Projects, recently authorized by the Secretary of Agriculture, will accelerate economic development in communities of West Virginia, Alabama, and Missouri.

Little Kanawha, W. Va.

The Little Kanawha Resource Conservation and Development Project covers 1,165,440 acres in Wood, Wirt, Ritchie, Roane, and Calhoun counties with 68 percent of the area in woodland (90 percent in small private lots) and about 28 percent in crops and pasture. In this area are 81 streams with more than 1,027 miles of fishable water.

The project is sponsored by the Little Kanawha Soil Conservation District and the county courts of each of the five counties.

Over a 10-year period, project measures are expected to generate 12,775 man-years of employment. Continuing opportunities for hunting, fishing, and other recreation developments will provide 37,050 additional user-days annually.

The accelerated development of the area's land and water resources involves soil surveys; technical assistance for conservation planning and land treatment on crop, pasture, forest, and other land; watershed projects to curb flooding, improve drainage, and provide water supplies for municipal and recreation use; development of sewage-treatment facilities; construction of adequate roads and bridges for moving products to market; and educational programs to stimulate higher income throughout the area.

Coosa Valley, Ala.

Sponsored by the county governing bodies and the soil and water conservation districts of Clay, Calhoun, St. Clair, and Talladega counties, the Coosa Valley Resource Conservation and Development Project covers 1.6 million acres of land in the Appalachian Region of east central Alabama.

The Coosa River flows southeast through the limestone valley section of the area. About 70 percent of the area is in forest, 11 percent in grassland, and 9 percent in row crops. Population of the area is 200,000.

If all of the proposed 75 measures are installed, project sponsors anticipate that income in the area will increase more than $12 million annually over a 10-year period.

Project measures include completion of seven small watershed projects for flood prevention, municipal and industrial water storage, and recreation; improved timber and grassland management; accelerated conservation planning and land treatment; and improved public and private recreation facilities.

The sponsors feel that development of outdoor recreation facilities is one of the greatest income-producing potentials in the area. Recreation is expected to add 6,000 new jobs in the area over the next 10 years.

Three new lakes already developed on the Coosa River, covering about 40,000 acres, will increase the recreation prospects in the area. Measures designed to improve use of the Talladega National Forest coupled with recreational developments undertaken by individual landowners will further add to the recreational opportunities.

Top of the Ozark Rivers, Mo.

The Top of the Ozarks Rivers Resource Conservation and Development Project includes five counties, Dent, Howell, Oregon, Shannon, and Texas and covers

2,970,880 acres. About 1,595,800 acres is in 7,987 farms, 10 percent being in cropland and 69 percent in woodland. Of the wooded area, 1.6 million acres is privately owned, about 77,000 acres State owned, and 327,000 acres in National Forests.

Project sponsors are the four soil and water conservation districts in Dent, Oregon, Shannon, and Texas counties, the five county courts, and the University of Missouri Extension councils.

Immediate benefits will be an increase in income from agricultural and forest products. Long-range benefits include creating an estimated 15,000 new job opportunities and an increase of several million dollars annually in gross income to the area.

In addition to accelerating technical assistance and services to farmers and land operators for soil surveys, conservation planning, land treatment, and forest management, the project will include 234 additional measures planned by various local groups. These include highway and bridge improvements, city and highway beautification, sewage disposal, hospitals, county health units, homes for senior citizens, recreation enterprises, education and training facilities, and industrial developments to create new jobs.

Included in watershed-protection and flood-prevention projects are measures to provide relief from flooding; reduce erosion; control sedimentation; furnish irrigation, drainage, municipal and industrial water supplies; increase fish and wildlife; and create recreation opportunities. ♦

Estimating System

USDA's agricultural estimating system is vastly more complex than it was a century ago, utilizing sophisticated sampling theory and electronic computers, as well as older methods of fact collection. ♦

CONSERVATION PROFILE

J. Harris Smith

Tennessee

Busy conservationist reaps many honors in State

TENNESSEE'S dean of conservation districts, J. Harris Smith, has not celebrated a birthday at home for several years.

"It comes in February," the tall Tennessean says, "and I'm always attending the National Association of Soil and Water Conservation Districts' annual convention. I turned 72 at New Orleans this year."

Mr. Smith's energy and untiring interest in district activities can be seen in his convention attendance record. He has appeared at 15 of the past 20 NACD conventions. He has missed only 1 meeting of the Tennessee Association of Conservation Districts since he helped to organize the group more than 22 years ago and that was because of illness.

Born and reared in a rural community near Jackson, Tenn., Mr. Smith has devoted his life to farming, except for a brief period in uniform during World War I. As a boy, he learned the basic chores of feeding, hoeing, and cutting firewood. At an age when most present-day youths are just learning to use a power lawn mower, Mr. Smith was plowing with a team, picking cotton, and doing a grown man's work on other jobs.

In the years before World War I, Harris Smith and his older brother, John Smith, bought a 150-acre farm on credit and started out together. By mutual agreement, this partnership was dissolved in a few years, and each determined to succeed independently.

In 1924, Mr. Smith took on a new partner, when he married Miss Annie Lake, a farm girl turned school teacher from Hardeman County.

The Smiths have lived and worked on the same farm in Madison County since their marriage. The original "home" farm consisted of 30 acres. They have added land until now they own and operate 1,028 acres. Their farming enterprises include corn, cotton, hay, pastures, and Angus cattle.

In 1941, the Madison County Soil Conservation District was organized. Local agricultural leaders, knowing of Harris Smith's keen interest in soil conservation, asked for his help in developing a program of work for the district. He accepted the job, became a member of the first board of supervisors, and served as its treasurer until 1945. At that time, he was elected chairman of the board, a position he has held continuously.

In addition to being a soil conservation district supervisor and a leader in his community, his interest and influence have con-

tributed greatly to agriculture over west Tennessee and throughout the State.

In 1942, only 18 out of Tennessee's 95 counties were in organized soil conservation districts. Mr. Smith, together with a dozen other agricultural leaders, met and organized the Tennessee Association of Soil Conservation District supervisors. He served for 3 years as president of this organization which now includes districts in all 95 counties and 77 organized watersheds. He also served the State organization as area vice president, and at present is a director.

The many honors won by J. Harris Smith include the "Master Farmers Award," sponsored by the *Progressive Farmer* Magazine and the University of Tennessee's Agricultural Extension Service. He also won the "Grand Sweepstakes Award" in the owner-operator division of the Save-Enrich-Our-Soil Contest, sponsored by the Memphis *Press Scimitar* in 1954, and in 1962, his fellow supervisors of the Madison Soil Conservation District board presented him with a distinguished service plaque.

In addition to his active soil conservation district work, Mr. Smith is presently the senior member of the Madison County Court. Elected in 1930, he has served his community and county as a magistrate continuously for 36 years.

Mrs. Smith is also a firm believer in soil and water conservation. She is a member of the Ladies Auxiliary of the Tennessee Association and is presently serving as its treasurer.

Harris and Annie Smith live in a beautiful country home on the farm they moved to when they were first married. They have one son, a medical doctor, and three grandchildren. ♦

George Fox at his desk at home.

Youth Conference Sets Goals for Creative Conservation

By George Fox
State President, Indiana FFA Association, Michigantown, Ind.

"IT IS THRILLING to me that for the first time in history, America's major youth organizations are joining hands for a common purpose. It is doubly thrilling to me that this purpose is environmental beauty."

The words were Mrs. Lyndon B. Johnson's as she spoke to us during the National Youth Conference on Natural Beauty and Conservation, June 27.

Indeed there is something "thrilling" about unity. It's the same creative tool I have seen SCS people using in my conservation district where they have successfully demonstrated that man and nature are not separate.

Unity, I believe, is a necessity of creative conservation. That's why I think it is significant that 20 million young people joined the cause of conservation during the National Youth Conference on Natural Beauty and Conservation.

The conference heard President and Mrs. Johnson urge the members of our organizations to dream impossible dreams and to translate the dreams and talk of today into the action of tomorrow. Among the final recommendations were:

That youth groups raise scholarship money to send teachers to conservation courses.

That manufacturers install litter containers in all automobiles, and advertisers emphasize "anti-litter" rather than "throw away" messages.

That young people take pictures of community eyesores and show them to their cities' editors.

That juvenile offenders work off their punishment in park beautification and maintenance.

That our organizations work together from now on, just as we did for the conference.

We realize our limitations and hope for guidance and support from adults. Even though some organizations start their interest in natural beauty and conservation with an obvious project like "litter prevention," they may readily be led into larger projects. More important, those who start with a vague kind of "beauty" objective can be led into an understanding of the unity of man and nature.

In this space age, it is easy to believe that the world was created for man's exploration and enjoyment. Such a belief has scarred the beauty of our Nation and wasted its natural treasures. We want to be the generation that changes this philosophy. This, in the long run, may be the real lasting value of our project.

George Fox, representing the Future Farmers of America, was chairman of the National Youth Conference on Natural Beauty and Conservation, held in Washington, D. C., last June as a followup on the White House Conference on Natural Beauty.

Soil conservationists and other adults who are well informed about conservation can help by:

Volunteering as a consultant. It is important when working with many youth organizations that you first approach the local *council* that has jurisdiction over individual troops or units in the area, rather than going directly to an individual unit.

Helping adult leaders gain conservation skills or knowledge that they in turn will share with members.

Inviting youth representatives to attend soil conservation district meetings as a part of their education, since districts are local bodies banded together to do the conservation job.

Inviting youth groups to tour watershed projects or be included in other ongoing conservation activities.

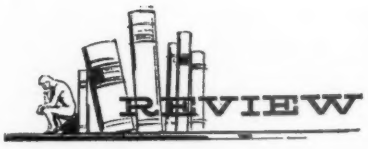
Urging the local Youth Programs Committee to send reports on its projects (pictures before and after if possible) to: The Coordinator, National Youth Conference on Natural Beauty and Conservation, 830 Third Avenue, New York, N.Y. 10022.

Finally, remember that many of the young people who attended the conference will be able to draw other groups into this challenging crusade for creative conservation and beauty. ♦

Grazing after Sagebrush Control

In grazing ranges after sagebrush control (1) avoid trailing livestock the first fall and winter across areas where sagebrush has been eradicated; (2) delay grazing until native grasses are vigorous and seeded forage plants are well established, as evidenced by seed production; and (3) practice good grazing management after the new forage stand is well established. ♦

USDA now has continous data for major crops and livestock since 1866. ♦



Origins of American Conservation. EDITED BY HENRY CLEPPER. *1966. Ronald Press Co., New York (for Natural Resources Council of America). 193 pp., illus. $4.50.* This small book offers information about the origins of the various major fields of conservation. It includes chapters on the conservation movement in general and on conservation of wildlife, forests, fisheries, soil, water, range, parks, wilderness, and scenic and historic sites.

Each chapter is a short history of the development of conservation in one of these fields. A final chapter deals with the outlook for the future.

Twelve authors, all professionally engaged in their respective fields, have written the chapters. The editorial committee included Edward H. Graham, Daniel E. Poole, and the chairman, Henry Clepper, who also wrote the first chapter.

This is not offered as a definitive historical treatise but as a useful reference for anyone seeking information about the many developing phases of conservation. The editor states that no other volume of this sort is available.—WILLIAM R. VAN DERSAL, *Deputy Administrator for Management, SCS.*

New Publications

Effects of Stocking Rates on Range Vegetation and Beef Cattle Production in the Northern Great Plains. BY WALTER R. HOUSTON AND R. R. WOODWARD. *1966. USDA Tech. Bul. 1357. 58 pp., illus.* Data from studies conducted in an area of mixed-grass prairie typical of the semiarid southwestern part of the northern Great Plains. At each of two separate areas, six pastures of native range were grazed each at a different stocking rate.

Calf weights at birth and weaning, rate of gain, grade, and value of calves produced per breeding cow were reduced by heavy stocking rates. Animal production per acre of grazing land was reduced at the heaviest stocking rate to below its previous level but not below the current level of lighter stocking rates.

A Century of Agriculture in Charts and Tables. *1966. USDA Agr. Hbk. 318. 44 pp., illus.* Gives in graphic and table form the production trends of major crops and livestock since 1866. The information is the product of a crop and livestock estimating system that is based on voluntary cooperation of farmers and other citizens and on the close collaboration of the States and the Federal Government.

Evaluating a Program of Conservation Education in the Elementary School. *1966. Interstate Printers and Publishers, Danville, Ill. (for Conservation Education Association). 40 pp. 50¢.* This booklet is No. 4 in a series entitled "Education . . . Key to Conservation." It contains a suggested scorecard for judging a conservation education program on the basis of philosophy, personnel, program, organization, principles, and conservation (i.e. subject matter).

Appalachian Hillside Pasture. *1966. USDA Leaflet 543. 4-page folder.* Basic information on using native pasture for feeding a few head of cattle or sheep in Appalachia (W. Va., and parts of Ala., Ga., Md., N. Y., N. C., Ohio, Pa., S. C., Tenn., and Va.).

Economics of Forestry. COMPILED BY FAY RUMSEY. *1965. USDA Misc. Pub. 1003. 45 pp.* A bibliography for the United States and Canada, 1960-62.

Soil Surveys

Somerset County, Maryland. BY EARLE D. MATTHEWS AND RICHARD L. HALL. *1966. 90 pp., illus.; maps 4 inches to the mile (1:15,840).* Survey by F. Z. Hutton, Sr.; H. H. Boston; F. A. Filios; Allen Greiner; Richard L. Hall; and Ronald Jones.

Tippah County, Mississippi. BY WILLIAM E. BRIGHT, WILLIAM I. SMITH, MALCOLM C. TYLER, W. L. WATTS, R C. CARTER, H. S. GALBERRY, AND W. W. NYE. *1966. 96 pp., illus.; maps 4 inches to the mile (1:15,840).*

Bexar County, Texas. BY F. B. TAYLOR, R. B. HAILEY, AND D. L. RICHMOND. *1966. 126 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Berkeley County, West Virginia. BY JOHN L. GORMAN, J. K. PASTO, AND C. D. CROCKER. *1966. 141 pp. illus.; maps 3.17 inches to the mile (1:20,000).*

From the Administrator:

Conservation Challenges in New Urban Areas

GROWING urban areas throughout the country create new problems in land use and resource conservation that increasingly engage the attention of professional conservationists, public officials, and local citizens.

Almost every growing urban area is in a soil conservation district, for the simple reason that 95 percent of rural America, outside of major public land areas, is in organized districts.

Wherever rural land is being converted to residential, industrial, or similar uses, the disrupting changes almost without exception are occurring within the jurisdiction of a local governmental unit responsible by law for programs of land and water conservation.

The problems of judging suitability of different soils for alternative uses, of controlling erosion during conversion from one use to another, of stabilizing each area after the new use is established, and of regulating runoff under the new hydrologic conditions—all these, and many related problems, call for different solutions under urban conditions than in the more familiar agricultural situations.

But basically, they are concerned with the same fundamentals of soil and water use that soil conservation districts and cooperating technical agencies have been dealing with for the past 30 years.

Many conservation districts now find themselves working with an increasing number of nonagricultural cooperators, such as local governments, school systems, planning commissions, various conservation organizations, land developers, industries, and urban residents.

The Soil Conservation Service, through its working agreements to provide technical services to conservation districts, finds itself correspondingly involved in conservation problems related to the conversion of agricultural land to nonagricultural uses.

The National Association of Soil and Water Conservation Districts, in a recent appraisal of the situation, concluded that if conservation districts are to make their most effective contribution to our society in the future, they must adjust their programs to embrace new phases of conservation and resource development.

The conclusion applies with equal force to the technical and professional conservation agencies responsible for providing the information and knowledge needed to find sound solutions to the new conservation problems.

If the new conservation demands of urbanizing areas are to be met, conservation districts (and supporting technical services) need to be broadened to (1) involve more people in resource work, (2) extend conservation services to additional people, and (3) place more emphasis on broad-based resource planning and accomplishment.

At the same time, the original purpose of conservation districts must continue to be to serve as effective local action organizations to get as much total conservation on the land as fast as possible.

In many cases, conservation districts could perform some of the work being taken on by the proliferation of new groups. The result would be less duplication, better coordination, and more efficient and useful programs.

The challenge that lies ahead is an exciting one. Whether it will be met depends on local leadership—it does not depend primarily on the National Association of Soil and Water Conservation Districts, the State associations, the State soil and water conservation committees, the Soil Conservation Service, or on any of the other agencies with whom districts work. Local leadership is still the key to moving ahead.

A fresh look at district opportunities is in order, as the country takes new interest in resource affairs under growing pressures at home and abroad.

Many State governments already are considering changes in State laws needed to broaden district mandates, increase representation of all community interests in the administration of districts, and provide the financial support and legal tools for conducting conservation programs aimed at resource and economic development, both rural and urban.

But more than State action is involved in strengthening the role of districts in resource planning and action. Federal programs and policies need to further recognize the ways in which the local conservation district can serve as a unique and valuable mechanism for unlocking the gates to action on the lands, forests, and streams of the countryside.

The importance of developing a responsible partnership between district officials and all conservation agencies has never been as important as it will be in the years ahead.

Genuine interest on the part of all concerned can lead to district programs of sufficient breadth to help advance *all* resource interests and the programs of *all* resource agencies to the benefit of *all* citizens.

The basic theories and ideas under which the system was established 30 years ago are as sound today as they were then. Implementation is even more urgent today then ever.

D. A. WILLIAMS

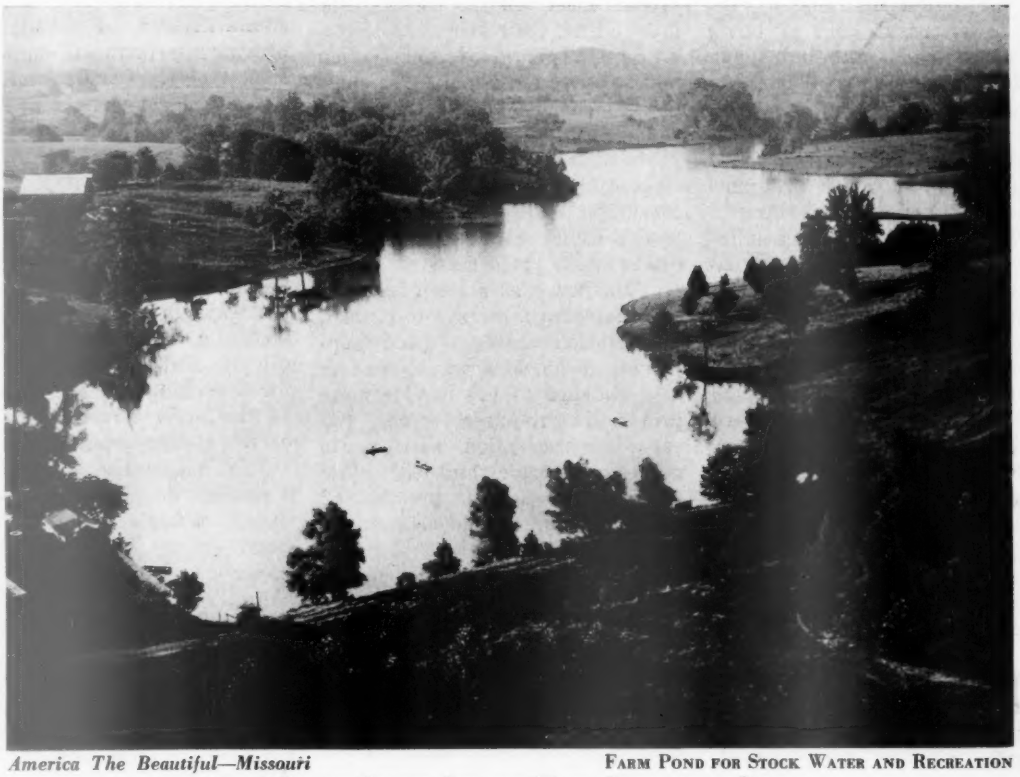
UNITED STATES
GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON, D. C. 20401

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U. S. GOVERNMENT PRINTING OFFICE

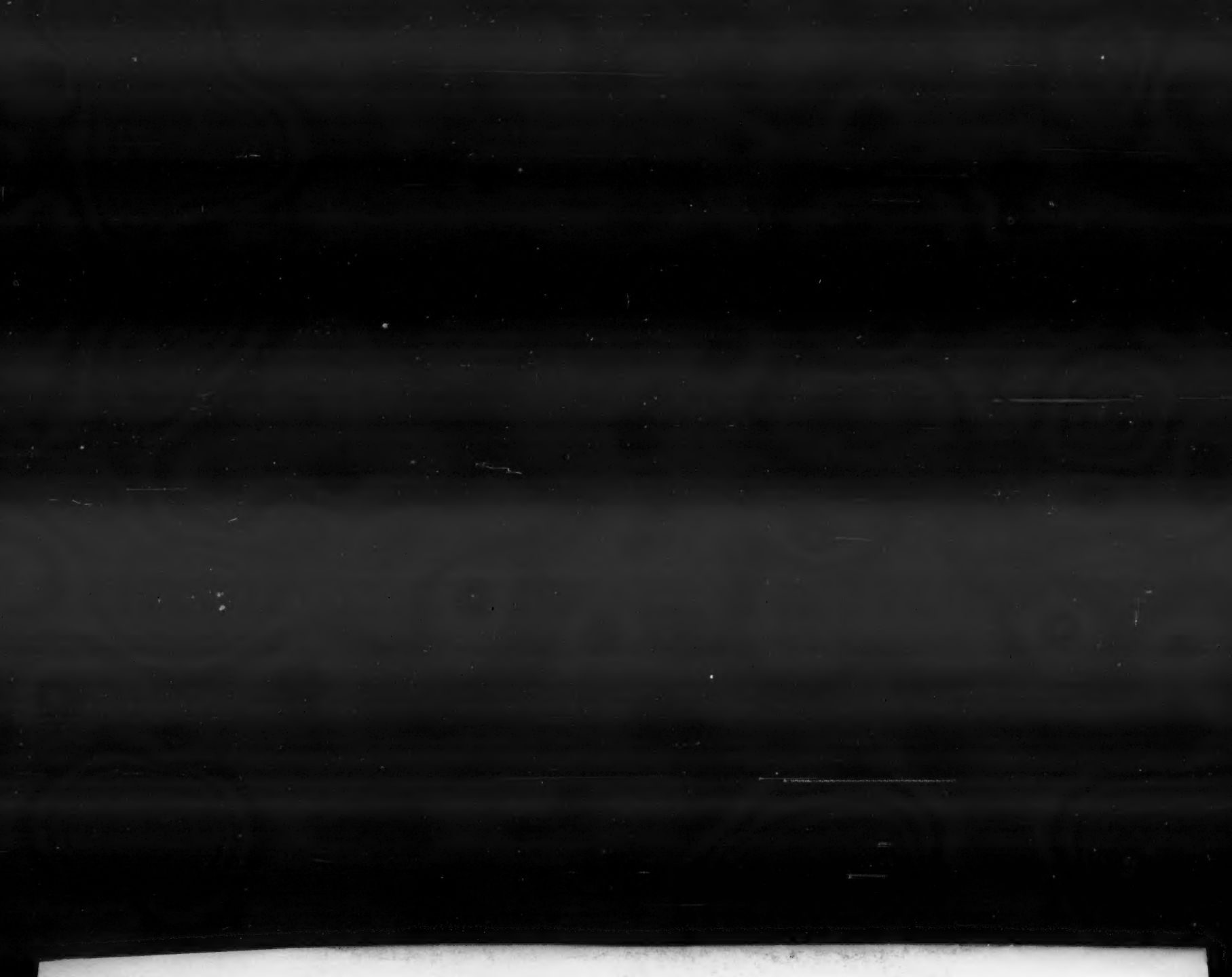
If your address changes, please notify us of your complete new address, including Zip Code number, and include old address with our code number as shown above.

America The Beautiful



America The Beautiful—Missouri FARM POND FOR STOCK WATER AND RECREATION
CAPE GIRARDEAU COUNTY SOIL AND WATER CONSERVATION DISTRICT

The "America The Beautiful" photo exhibit—one picture for each State, Puerto Rico, and the Virgin Islands—has been reproduced in full-color lithographs suitable for framing. Prints are available from the Superintendent of Documents for 10 cents each or $5.00 for the complete set. Order blanks can be obtained from local Soil Conservation Service offices and at most post offices.



SC OCT 45829
UNIVERSITY MICROFILMS
SERIALS SECTION
313 NORTH FIRST ST
ANN ARBOR, MICH

UNITED STATES
GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON, D. C. 20401

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U.S. GOVERNMENT PRINTING OFFICE

If your address changes, please notify us of your complete new address, including Zip Code number and include old address with our code number as shown above.

On-the-Ground Instruction in Conservation

Story on page 80

Sixth grade students in Douglas County, Wash., got on-the-ground instruction in conservation of soil, range, woodland, and wildlife on a conservation field day tour led by supervisors from three conservation districts. Above, Al Young, SCS range specialist, explains how overgrazing depletes native bunch grasses. The children also learned to identify several important range grasses.